Cultural Resource Specialist Report

Boulder Creek Fuels Restoration Project

Hume Lake Ranger District
Sequoia National Forest and
Giant Sequoia National Monument

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Relevant Cultural Resource Laws, Regulations, and Policy

Protection and management of cultural resource on National Forest System land is mandated by the National Historic Preservation Act, 1966 as amended (NHPA), 36 CFR 800, Forest Service Manual 2360, American Indian Religious Freedom Act, Archaeological Resource Protection Act and the National Environmental Policy Act (NEPA). In addition Pacific Southwest Region has developed alternative procedures, per 36 CFR 800.14, in the form of the *Programmatic Agreement among The U.S.D.A. Forest Service, Pacific Southwest Region (Region 5), California State Historic Preservation Officer, Nevada State Historic Preservation Officer, and The Advisory Council On Historic Preservation Regarding the Processes for Compliance with Section 106 Of The National Historic Preservation Act for Management of Historic Properties by the National Forests of the Pacific Southwest Region, 2013 (Regional PA)*

Area of Potential Effect (APE)

Pursuant to the Regional PA the Area of Potential Effect (APE) for Cultural Resources identification and analysis for the Boulder Creek Fuels Restoration Project encompasses all areas to which prescribed fire will be applied, control lines constructed or utilized, and equipment and material storage or staging areas, which encompasses approximately 14,385 acre, of which 6,000 to 9,000 acres would be proposed for underburning (see Figure 1). In Figure 1 the APE is labeled as Project Boundary.

Project Description

Location

The proposed project area is located in the eastern portion of the Hume Lake Ranger District of Sequoia National Forest and Giant Sequoia National Monument in Townships 13 and 14 South, Ranges 29 and 30 East (Mount Diablo Base and Meridian)(Figure 1). The project area boundaries are the Sheep Fire edge and Deer Meadow Trail (Forest Trail 30E05) on the east, portions of Big Meadows and Burton Pass roads (Forest Road (FR) 14S11 and 14S02 respectively) on the south, a portion of FR 13S26 on the west, and State Highway 180 and the Kings River on the north. The project area includes portions of Monarch Wilderness, Agnew Roadless Area, the Wild and Scenic South Fork of the Kings River, and giant sequoia groves (Agnew, Deer Meadow and Evans Complex). The project area encompasses approximately 14,385 acres and is within Fresno and Tulare Counties, California. Elevations in the project area range from a low of approximately 3,200 feet near the Kings River to 8,500 feet near the Deer Meadow Grove. The proposed project area is described in detail in the Boulder Creek Fuels Restoration Project Environmental Assessment (USDA Forest Service 2012).

The project area is comprised primarily of mixed conifer, oak woodland, and chaparral. The higher elevations are dominated by conifer stands, while the lower elevations are in the transition zone between the conifer and hardwood/shrub/grassland vegetation types. Table 1 shows a summary of project area vegetation, based on Forest Service vegetation GIS layers last updated in 2007.

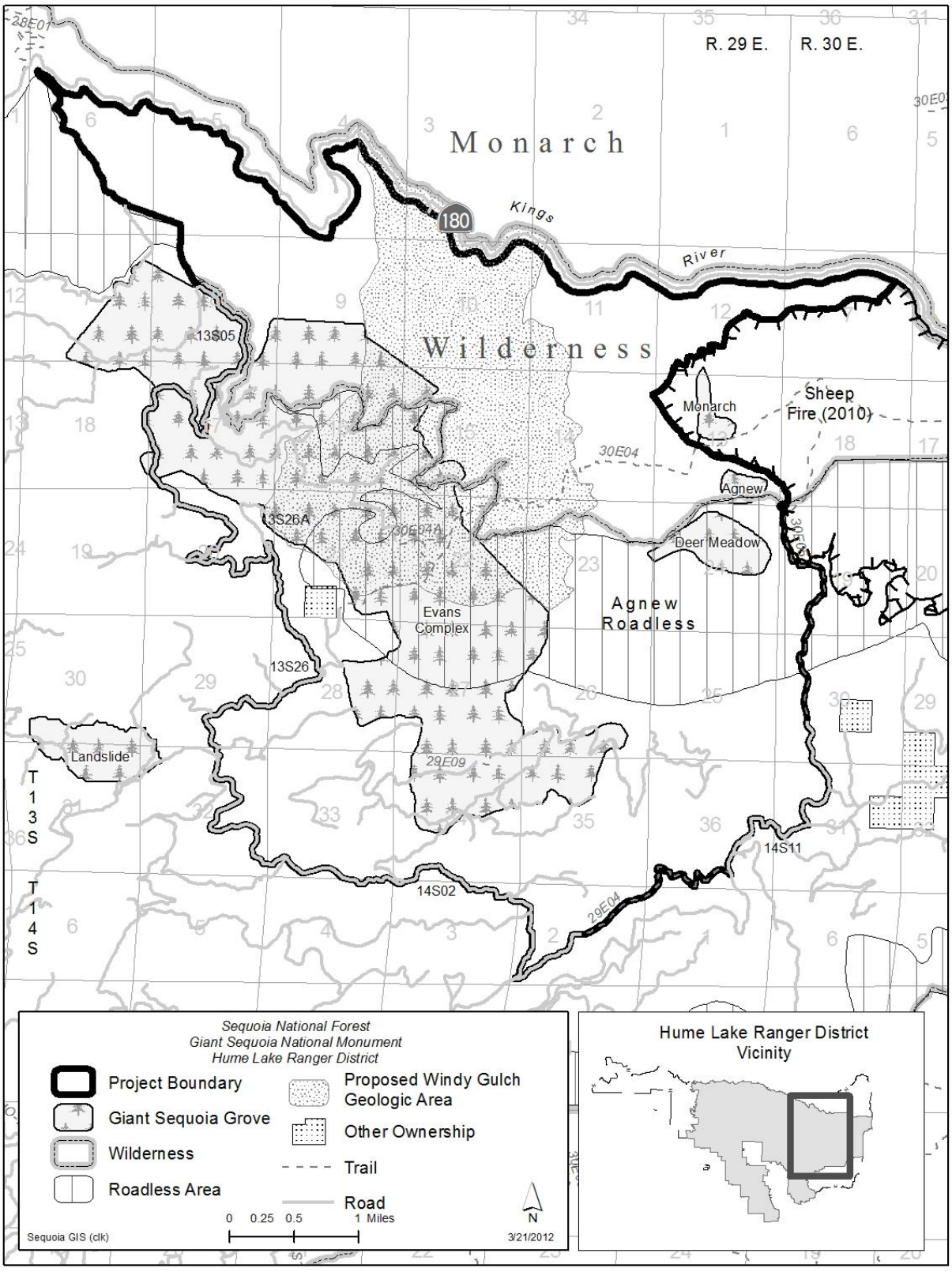

Figure 1: Area of Potential Effect

Cover Type	Project Area Acres
Coniferous Forest (ponderosa pine, red fir, Sierran mixed conifer and lodgepole pine)	9,718
Hardwood Forest (montane hardwood and montane hardwood-conifer)	2,350
Shrubland (montane chaparral and mixed chaparral)	2,000
Barren	224
Annual grassland	89
Wet meadow	3

Table 1: Vegetation Types in the Boulder Project Area

General Description

The project uses prescribed fire within the lower portion of the Boulder Creek drainage to restore ecological processes and improve overall fuel and vegetative conditions. Not all of the project area would be burned, based on the desire to limit smoke production, protect established plantations and cultural resources, and varied topographical and fuel conditions. An estimated 6,000 to 9,000 acres of the total 14,000 acre project area would actually be burned over the five year duration of the burning treatments.

The majority of the Boulder Creek drainage has missed the last five fire return intervals (100+ years of fire exclusion). It is in steep inaccessible terrain with a moderate to heavy fuel layer, contained mostly in the Agnew Roadless Area and Monarch Wilderness.

This project is needed to:

- Reduce excessive fuel loads across the landscape, specifically within the Monarch Wilderness per Manual direction (FSM 2320);
- Re-establish fire to this fire-adapted ecosystem, specifically within several sequoia groves;
- Reduce the risk of loss of old-growth forest habitat to large scale, stand-replacing wildfires; and
- Reduce the risk of loss of cultural resources to wildfires.

The purpose of this project is to:

- Establish or maintain conditions that allow for safe and efficient fire suppression activities;
- Establish conditions that allow for a highly diverse vegetation mosaic of age classes, tree size, and species composition; and
- Protect the other objects of interest where applicable and feasible.

Alternative 1 - No Action Alternative

Under the No Action alternative, current management plans would continue to guide management of the project area. No prescribed burning would be implemented to accomplish project goals.

Alternative 2 - The Proposed Action

This alternative would reintroduce fire into the lower portion of the Boulder Creek drainage with prescribed burning on 6,000 to 9,000 acres. Not all of the project area would be treated, due to large areas of rock and other features that would need other treatments prior to, or instead of, prescribed fire.

This alternative was designed to limit the impact smoke would have on the airshed. Prescribed fires would be ignited in the fall, with some limited ignitions in the spring, one or two weeks prior to a predicted rain/snow event. This would allow the prescribed fire to burn long enough to achieve resource goals before wetting rains or snow extinguish the active burning in the project area. The duration of active burning and smoke impact on the airshed is expected to be two weeks.

The project area would be burned in sections over approximately 5 years. The burn treatments would begin on the east side of Boulder Creek in year one and work in a counter-clockwise direction over the years. The Boulder Creek Fuels Restoration Project Environmental Assessment provides a detail description and maps of the proposed treatments.

The treatments are designed to reintroduce fire and produce a mosaic of age classes, tree size and species composition across the landscape. No mechanical treatments or removal of logs or other forest products is proposed under this project.

After the prescribed burn treatments, hand crews would repair trail tread if the burning activities damaged hiking trails. The treadwork may include reestablishing waterbars or other drainage features along the trail. These activities would be designed to reduce the potential for erosion or sedimentation as a result of the fuels reduction activities, and manage that portion of trail to standard.

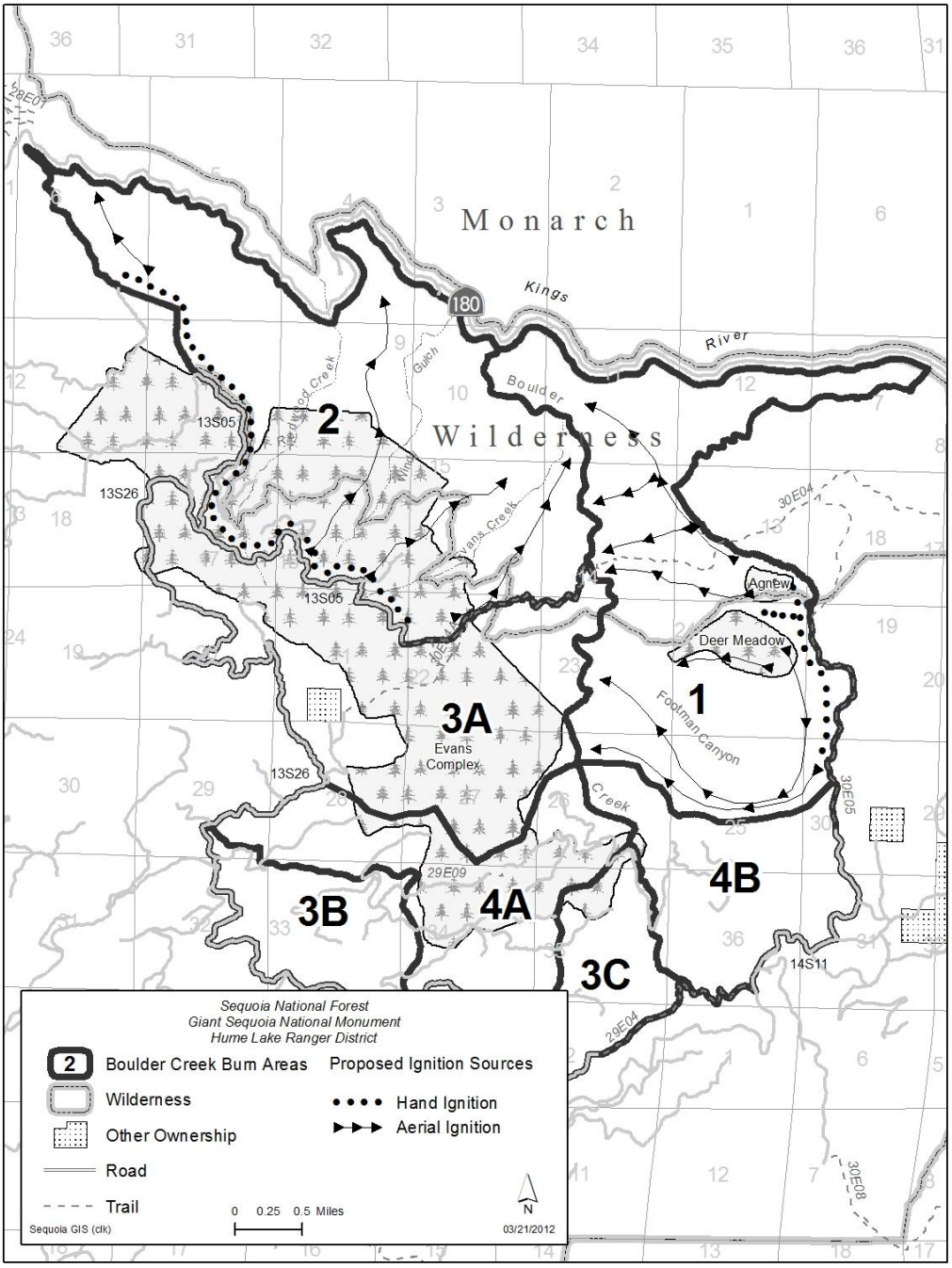

Figure 2: Proposed Treatment Units

Area 1: Fall 2013

As shown on Map 2, Area 1 would be on the east side of Boulder Creek. Area 1 would burn vegetation between Boulder Creek on the west and Deer Meadow Trail (FT 30E05) and the Sheep Fire on the east. The treatment would start in the south along the southern ridge forming Footman Canyon, and extend north to the Kings River.

Fire would be lit in two stages. First, fire would be lit by hand (such as drip torch) beginning at the junction of the ridge south of Footman Canyon and FT 30E05, and continue along the ridge toward the Kanawyer Trail (FT 30E04). Where FT 30E05 meets the Monarch Wilderness boundary, hand ignitions would stop northward progression of the fire, and it would be allowed to back off the ridge line. Once fire reaches the Agnew and Deer Meadow Giant Sequoia Groves more hand lighting would be used to keep the flame lengths and rates of spread in the grove area at a moderate level (1 to 3 foot flame length, 1 to 15 chains per hour rate of spread) to avoid burning up sequoias.

Along the southern boundary of Area 1, the ridge south of Footman Canyon extends in a westerly direction until it meets Boulder Creek (the western boundary). A control line would not be constructed on this ridge; instead fire would be allowed to back over the ridge to the south into Area 4B (see Figure 3). Fire would only be allowed to creep in Area 4B for up to one to two weeks (i.e., until the predicted rain/snow event occurs).

As part of this project, FT 30E05 (Deer Meadow Trail) would be maintained through trail treadwork, and brushing along the trail prior to the prescribed burning. This maintenance work would allow the trail to serve as a barrier during the burn to mitigate the potential for fire to cross at locations south of where the Sheep Fire burned (see figures 1 and 3).

Once the hand ignition is completed on the ridge and the sequoia grove area, stage two would begin. Stage two would be lighting fire from an aircraft (such as a plastic sphere dispenser (PSD) from a helicopter) (aerial ignition). The aerial ignition would focus on helping the fire to back down the ridge and down slope toward the creek. Fire would also be ignited using the PSD on the east-west ridges within the unit (See figure 4).

Area 2: Years 2 – 5[1]

Area 2 is located northwest of Area 1 and bounded by Boulder Creek on the east, Forest Road (FR) 13S05 (Camp 7 Road) on the south, the Kings River on the north, and a combination of Forest Service roads and hand line on the west side.

Due to cultural resource concerns and recreation activities in the vicinity of Evans Grove Complex, fire would be ignited only in portions of this area. The portion of the unit between FR 13S05 and the wilderness boundary the unit will be divided into subareas which could be ignited by hand to allow for both firefighter safety and the protection of cultural resources. Control lines and hand fuels reduction, using handtools and chainsaws, will be used in this area to protect at risk historic properties and features.

Continuing to the north in Area 2, prescribed fire operations would be a combination of aerial and hand ignition (see Map 2). From the wilderness boundary and continuing north the terrain becomes steeper as you go toward the South Fork Kings River. Aerial ignition would occur along the ridges in this portion of Area 2, and fire would be allowed to back down the slopes naturally toward the Kings River until the predicted rain/snow event arrives.

[1] Though the intent is to treat an area each year, weather and other factors may delay or accelerate treatments of individual areas.

Area 3: Years 2 - 5

Area 3 is broken down into three subareas: A, B and C which are interspersed among areas of no planned ignition treatments (Area 4). Area 3 A, B and C would have similar treatment guidelines as described above for Areas 1 and 2. This is the only area that includes spring burning, and is located in the southern portion of the project area (see Figure 3). *In addition, based on the effects analysis, portions of Area 3 could be burned prior to Areas 1 or 2 because it is not dependent on the reduced fuels in the other areas to provide barriers.*

This phase of the burning would include the numerous young conifer plantations in the southern project area. Identified burn areas would be divided into small units of 40 to 100 acres, and would be burned over one or two days per unit. In addition, due to the timing of the burning, wildlife surveys would need to be conducted. If active California spotted owl or northern goshawk nests were found, handline may need to be constructed or the burn unit boundary modified to ensure nesting areas are not negatively affected by the prescribed burning.

In portions of Area 3, specifically 3A within Evans Grove Complex, there are known cultural resources and recreation facilities that may need protection during or after burn treatments. To protect cultural resources, fire control lines or fuel breaks may be constructed by hand crews, or fire would be lit under a prescription for low intensity to reduce fuels.

The smaller burn units and shorter burn durations would allow fire managers to reintroduce fire to the landscape under controlled conditions without unwanted ignitions encroaching into plantations or sensitive cultural resource sites. This is slower and more costly, but gives the burn boss more control over timetables and fire intensities. The specific unit areas have not been identified. Unit designations would occur as specialists are able to analyze and help identify areas that can be burned without negatively affecting other resources or objects of interest.

Area 4

Area 4 is broken down into two subareas: A and B which are planned for no active ignition treatments at this time (see Map 2). Several existing plantations are located in Area 4 and the vegetation is currently a mix of trees and brush which form a contiguous pocket of ladder fuels. Prescribed burning in these plantations, especially Area 4A, would likely result in a fire that would burn up most of the trees and the reforestation investment they represent.

However, Area 4B contains more wild stands intermixed with plantations, so fire would not be excluded if it enters the general area from the treatments proposed in Area 1. Instead, fire would only be allowed to creep in Area 4B for up to one to two weeks (i.e., until the predicted rain/snow event occurs), and would be closely monitored and managed to minimize damage to the planted trees and the reforestation investment they represent. In the event that fire threatens these plantations south of Footman Canyon, minimally

invasive suppression actions (i.e., hose lays, existing road systems, or narrow hand constructed fire control line) would be used to protect resources.

Existing Conditions

Cultural resources are an object or definite location of human activity, occupation, or use identifiable through field survey, historical documentation, or oral evidence. Cultural resources are prehistoric, historic, archaeological, or architectural sites, structures, places, or objects and traditional cultural properties (FSM2360.5). These resources are not mutually exclusive and can oftentimes overlap either in time and space (e.g., an historic building on a prehistoric archaeological site). Both prehistoric and historic sites are considered "objects of interested" under the Clinton Presidential Proclamation.

Prehistoric archaeological sites such as lithic scatters, food-processing sites, rock shelters, village sites, petroglyphs, and pictographs are found in the APE. These sites have the potential to shed light on the roles of prehistoric peoples, including the role they played in shaping the ecosystems on which they depended. Historic sites consist mostly of historic logging, remains of homestead properties, Forest Service administrative sites, and mining sites.

Prehistoric Background

People first arrived in California more than 13,000 years ago (Johnson et al. 2002). Archaeological data indicates that humans have inhabited the Southern Sierra Nevada and portions of the Monument for at least 9,000 years.

The earliest human occupation of the Monument could have come from either the west (Tulare and Buena Vista Lakes) or southeast (Great Basin), where fluted projectile points have shown the presence of people 8,000 to 10,000 years ago. Few large-scale archaeological excavations or data syntheses of sites in the southern Sierra Nevada have been undertaken, thus leading to the use of chronologies based on sites in the Mojave Desert and Great Basin with their emphasis on pinyon procurement, a resource not found in the project area. Using data from lower elevation sites in the foothills of the San Joaquin Valley, Moratto et al. (1978) hypothesized that early prehistoric settlement was large villages along the lower reaches of rivers near junctions with main tributaries, and large scale sites did not appear in the mid-elevations until after 3,000 years Before Present (B.P.). Unpublished data from archaeological sites in the Giant Sequoia National Monument, however, have indicated that there were major villages located away from large rivers at times much earlier than Moratto et al. (1978) suggests. Currently the Southern Sierra Nevada cultural chronology has been based on McGuire and Garfinkel's (1980) work along the Pacific Crest Trail but because of the project's geographic position closer to the San Joaquin Valley it probably received greater influence from the valley.

Prehistoric land use in the project area includes: habitation, hunting, fishing, food gathering, and food processing. Site components generally associated with this type of use include: housepit depressions, bedrock milling stations, milling equipment, flaked stone tools, debitage, and art including petroglyphs and pictographs.

Ethnography

The project area is located within traditional territory of the *Wobonuch* (Gayton 1948:257). The *Wobonuch* are represented by what is today the Dunlap Band of Mono Indians. The Dunlap Band is comprised of the amalgamated tribes of the *Entimbitch* and *Woponuch* (also known as *Wobonuch)*. The *Woponuch*'s primary village was *Ko'onekwe*."Their traditional territory extended east/west along the South Fork of the Kings River and to the north, encompassing Rodgers Ridge and beyond. They were directly east of their adjacent neighbors, the *Entimbitch*, and the two tribes interacted regularly. Post contact historic processes in the late 19th century forced the *Woponuch* out of their remote and secluded home and into the lower elevation Dunlap area, where they took up permanent residence among the *Entimbitch*. The last residents of *Ko'onekwe* moved out to Dunlap by about 1910…" (McCarthy 2000:1).

Gayton (1948:254) states that The *Wobonuch* occupied the entire drainage of Mill Flat Creek, as well as the Kings River from its confluence with the North Fork eastward well into the high sierras. The *Wobonuch* area also included from the Sequoia Lake in the south to settlements on both sides of the North Fork of Kings River in the north.

The *Wobonuch* belong to the Western Mono tribal group. The Western Mono, also known as the Monache, speak dialects of Mono which belongs to the Numic branch of the Uto-Aztecan language family. The preponderance of Numic speakers occupy the Great Basin, and it is thought that only within relatively recent prehistory that the Western Mono peoples moved across the Sierran crest to settle on the western slopes, in an elevational zone just above the Foothill Yokuts. This settlement is so recent that Gayton (1948:1) states, "The outward similarities of culture now to be found between Yokuts and Western Mono are largely a veneer assumed recently by the latter".

The *Wobonuch* and lived in relatively small villages consisted of less than 75 persons with a sweathouse and one of three types of dwellings a conical house with an excavated floor, an oval house with a ridgepole, or a conical bark covered house with a center post.

The *Wobonuch* were hunter gatherers who fished. They hunted deer, ground squirrels, and rabbits using bow and arrow made from California laurel or sinew-backed juniper and obsidian received through trade from the Great Basin. Within the immediate vicinity of the project area, the *Wobonuch* built weirs and caught fish during seasonal runs on Mill Flat Creek. They gathered acorns, pinion pine nuts, and hundreds of other plants and processed many of the plants in either portable ground stone or bedrock milling features. Insects, grubs, and seeds were eaten after being parched with coals in a winnowing basket.

Historic Background

The Boulder Burn Area remained outside of Euro-American influence until the late 1800s. Explorers may have passed through the area during exploration of Kings Canyon but there is no record of their passing. The Gold Miners also may have passed through in search of gold but finding none quickly moved on either to the North or later to the

South. The Gold Rush of the 1850s did leave a significant impact on the San Joaquin Valley to the west of the Boulder Burn and that impact would directly lead to the major Euro-American activity, logging, that took place in the Boulder Burn Project Area. By the mid-1850s the town of Visalia was a major station along the Stockton-Los Angeles and Butterfield Stage Roads, and in 1852 Tulare County was organized. Fresno County was organized in 1856. Cattle ranching and timber harvesting quickly spread eastward from Visalia into the foothills and mountains. By the early 1860s, foothill community of Squaw Valley was being settled and people were traveling through the area that would become the Hume Lake Ranger District.

By the mid-1850s, the demand for lumber in the valley brought loggers to the mountains. Paul Spivey documented over 35 sawmills operating in what is now the Hume Lake Ranger District between the mid-1850s and 1920 (Brown and Elling 1981, Larson, 1985:69-71). One of the earliest mills constructed and operated by Smith and Hatch was located near present-day Miramonte in 1854 or 1856 (Elliot 1883:157, as quoted in Brown and Elling 1981:48 and Larson 1985:68). These earliest lumber mills were located in the lower elevations, investments were minor and the operations were small. "In addition, these mills were technologically primitive, compared with the mills soon to follow. These technologies were not restricted to a single type, but they did generally represent low-level stages within the evolution of the sawmill" (Brown and Elling 1981:54). The first sawmills "were always built where they could recover the most wood with the least effort. So, as trees continued to be felled, the sawmill sites moved progressively farther up into the mountains (Larson 1985:58). The mills of this period were mostly owned by individuals or by small partnerships, operating with minimal capital, a small labor force, and served primarily local markets. Mills were "…changing hands, names, owners, and locations very often – so often, in fact, that accounts of this area during this period are often disorganized and confusing…" (Brown and Elling 1981:48). They usually focused on sugar pine or yellow pine and only logged those redwoods in their way. In 1869, Charles Converse made an unsuccessful individual attempt to log the giant sequoias (Rose 2005:13).

In 1873 the California State Legislature passed a law stating that "any person or persons who shall willfully cut down or strip of its bark any tree 'over sixteen feet in diameter' in the groves of big trees situated in the counties of Fresno, Tulare or Kern or shall destroy any of said trees by fire, shall be guilty of a misdemeanor" (Johnston 1974:18). As the logging industry expanded timber was viewed as Central California's "first merchantable wealth" and one writer, in describing the symbiotic relationship of lumber, mining, and agriculture stated: "The history of the lumber business is identical with that of the country. "The progress of one is essential to the prosperity of the other" (Barton 1907:1, as quoted in Brown and Elling 1981:48). Expansion of Euro-American populations into the San Joaquin Valley in the late 1800s brought the establishment of new towns including Porterville, Ducor, and Terra Bella. For the first 25 years of its existence, Porterville occupied a relatively isolated part of the valley until 1888 when the Southern Pacific Railroad arrived and the town grew to become one of the larger trade centers in Tulare County. Since the 1890s, the Porterville area has been a major supplier of citrus in the state. The rapid expansion of Porterville and other towns caused the need for more

lumber, thus the growth of the timber industry and mills. By the mid-1870s, larger operations such as Hyde's Mill on Redwood Mountain were logging sequoia trees and processing as much as two million board feet per year (Dilsaver and Tweed 1990).
In 1878, the Timber and Stone Act was passed which allowed people to purchase public domain land, that was "unfit for farming", but good for "timber and stone" purposes (logging and mining), for $2.50 per acre in 160 acre blocks. The purchaser signed an affidavit that he was entering the land exclusively for his own use and there was no association to enter more than 160 acres. However, the act was often used by speculators to increase their land holdings at minimal expense and this is exactly what happened in the formation of the Kings River Lumber Company.

One of the first major logging of Sequoias occurred in the Big Stump Grove between 1883 and 1889 by Smith Comstock. In the summer of 1886 and 1887, the land offices of Stockton and Visalia received a large number of filings under the Timber and Stone Act for specific 160 acre quarter sections in recently surveyed timber lands near Mill Flat Meadow (today known as Sequoia Lake). Two San Francisco lumbermen, Hiram C. Smith and Austin D. Moore were suspected of "importing" and having made prior arrangements with "locators", who, for a fee, would file for and obtain title to the quarter section of land, then turn it over to them. In March 1888, the San Francisco Chronicle announced that Smith and Moore had obtained thousands of acres of prime timber land on the Kings River and planned to build two sawmills with a combined capacity of 140,000 board feet per day (Johnston 1974:24). The Kings River Lumber company was incorporated on April 24, 1888 with Austin D. Moore, president, and Hiram C. Smith, vice-president.

The Kings River Lumber Company concentrated on logging the conifer forests surrounding the mills. The mills were relatively permanent structures, and were not intended to be moved about the forest like the earlier, portable mills were. Two railroads were built in 1891 in order to gain access to timber stands further away from the mills (Johnston 1974:40). In 1892, as part of plans to begin logging the Converse Basin sequoia grove, a seven mile railroad and an incline to the top of Hoist Ridge were constructed. After a few years of full operations in the Converse Basin, the Sanger Lumber Company was still unable to fully recover from its prior financial problems. In December 1905, the Sanger Lumber Company was sold to Hume-Bennett Lumber Company. The Hume-Bennett Lumber Company was a Michigan corporation with Thomas Hume as President and Ira Bennett as vice-President.

The Hume Bennett Company began operations by rebuilding the Converse Mill. They began logging in an area northwest of Hoist Ridge, but by 1908, they decided to close the Converse Mill and relocate to where virgin stands of fir, pine, and cedar still remained. They intentionally burned down the Converse Mill. The site of the new mill and associated operations was Long Meadow, four miles east of Converse Basin. The first structure built for the new operations was a multiple-arch concrete dam built to retain waters from Tenmile and Long Meadow Creeks. The impoundment created a storage pond for logs and is the modern-day Hume Lake. In 1908 the company began construction on the John S. Eastwood designed Hume Lake dam which is the world's

first reinforced concrete multiple-arch dam. Nineteen new miles of flume was built up Tenmile Creek to the dam increasing its length to a total of 73 miles, making it at the time the world's longest flume (Satterthwaite 1994:14). The new sawmill and supporting facilities represented the cutting edge of milling, including its own electrical generators. By 1912, 27,003,873 board feet of lumber was flumed to Sanger and almost 1,000 men worked at the mill or in the woods to provide that lumber (Johnston 1974:119).

As the dam, flume and new mill at Hume Lake were being built crews were also laying railroad track to the east into the Evans Grove. As early as 1911 plat maps show the proposed preliminary route that would extend the railroad east into Horseshoe Bend Grove from the Camp Four area (Brown and Elling 1981:85). In 1911, two railroad lines were in use; one line, known as the "switchback line", headed to the north then east across Tornado Creek towards the redwoods to the Camp Four area, and the second railroad, called the "pine line", extended south up Tenmile Creek to Bearskin Meadow. Along the pine line, heavy logging of fir, sugar pine, and yellow pine occurred (Johnston 1974:116).

In 1914 the market for redwood was more active than pine and the Hume-Bennett Lumber Co. decided to focus on redwoods and converted its entire railroad from narrow gauge to standard gauge to transport the heavier redwood in order to allow expansion of the eastern line (Johnston 1974:119).

Camp Four just west of the project area and Camp Six were established in 1914 and Camp Seven was established in 1916 (Brown and Elling 1981:84). At Camp Six a small incline reached into an 80-acre timber tract called "Jones Park" (Johnston 1974:122). "Sky-line" logging was also used to clear timber from near Camp Six at Redwood Creek, using yarding engines that pulled overhead cable attached to logs in order to move timber across impassable terrain (Johnston 1974:122). Camp Seven was set above Windy Gulch Grove and Evans Creek near the end of the main railroad line in 1914. From there an incline and hoist were established north of the camp to bring timber out of a canyon (Johnston 1974:124).

During 1915-1916 the Hume Bennett Lumber Co. built 5.495 miles of railroad at a cost of $8,568.11 per mile (total $47,081.88) and logged 31,733,840 feet of lumber (Rail Road Cost Data n.d.). During the height of the logging three 2-ton Shay engines were in use (Brown and Elling 1981:84). 1917 brought numerous changes to the Hume-Bennett Lumber Co.; first on January 24, 1917 the Hume-Bennett Lumber Company changed its name to Sanger Lumber Company. The United States entered World War One and 40 percent of the workforce joined the armed forces. On November 3, 1917 fire consumed the Hume Lake mill, damaged the drying kilns and upper portions of the flume (Johnston 1974, pp. 125,131). The Hume Lake Mill was replaced with a smaller open-air circular mill in 1918 (Johnston 1974:133). Sanger/Hume-Bennett operations continued at a decreased output until 1923. In 1924 manager George Hume left California and in 1926 a fire burned 2,000 boxes (16 foot sections) of flume along the Kings River and the section was never rebuilt (Johnston 1974:135). In 1927, equipment was sold to E.M. Prescott and the flume was sold off in sections on an "as-is, where-is" basis. The remaining sections of

the flume along Tenmile Creek burned in a fire started by construction of Highway 180 in 1931 (Johnston 1974:138). In its lifetime the Sanger/Hume-Bennett Lumber Co. cut an average of twenty million board feet, using three locomotives, fifty log cars, and about fifty miles of track (Rehart et al. 2007:67).

On April 8, 1935 over 20,782 acres of land owned by Sanger Lumber Company was sold to the U.S. Forest Service for $319,276.75. The land included 11 sequoia groves. (Johnston 1974:139)

In the late 1930s, the Forest Service began the cleanup of obsolete lumber camps, hauling away tons of rusting scrap metal and dismantling and removing collapsing structures (Johnston 1974:151). In 1950-51, the Forest Service split up nearly 1,000,000 board feet of redwood that had been left near Camp Seven. The wood was sold for fence posts (Johnston 1974:152).

Site Identification Methodology

Archaeological Survey Coverage

Approximately 40%, 5,825 acres, of the area of potential effect (APE) had been surveyed by twenty-two archaeological projects, see table 1. The most recent survey occurred during June 2012 when Forest Service archaeologist from the Sequoia and *Heritage Stewardship Group (HSG),* a USDA Forest Service Enterprise Unit, surveyed 1,067 acres for this project.

Table 2: Previous surveys. (SG= Survey General, SC = Survey Cursory, SI= Survey Intensive, COM=Complete, UNK= Unknown, CT=Contract, FSA = Forest Service Archaeologist, PARA = Para-Professional Archaeologist)

SURVEY #	SURVEY PROTOCAL	SURVEY NAME	AUTHOR
R051351000??	SG, COM	Arch Recon Evans Grove Project Area	CT
R1992051351001	SG, SI, SC	Arch Recon of Box, Boulder, Cherry Gap, Goodmill, Hume Lake, Pine Mill	CT
R1991051351???	SC	Barton's Resort Brush Crushing Project	FSA
R1990051351002	SC, SG, SI	Buck Insect Salvage Sale	FSA
R2009051351046	SI	Buck Rock OHV Volunteer Trail Maintenance Project	FSA
R1988051351???	SC	CR Survey of the Lightning, Garage, and White Timber Sales	CT
R1988051351???	SI	CR Survey of the Lightning, Garage, and White Timber Sales	CT
R1993051351001	SG, SC	CR Survey of the Pinehurst Insect Salvage, Bacon	CT
R1994051351???	SI	Deer Meadow Trail Relocation Project	FSA
R2000051351???	UNK	East Salvage Sale	FSA
R2008051351071	SI	FY2008 Hume Lake Trail Surveys	FSA
R1982051351???	SC, SI	Grove Timber Sale	CT
R2008051351091	SI	Hume Lake Fire Surveys FY2008	FSA
R2009051351065	SI	Hume Lake Pile Burn Plan	FSA
R2007051351007	SG	Hume Lake Roadside Salvage	FSA
R2009051351021	SI	Kanawyer Trail	FSA
R2010051351036	SI	Kanawyer Trail Maintenance	FSA
R1982051351005	SI, SG	Little Timber Sale	PARA
R1986051351002	SG, SC, SI	Pony/Spiro Timber Sale	FSA
R1987051351001	SC, SI	Scenic Byway	FSA
R2010051351052	SI	Sheep Fireline Survey	FSA
R1987051351003	SI, SG	Weaver Timber Sale	FSA
R2012051351004	SI	Boulder Creek Fuels Restoration Archaeological Survey	FSA

All surveys followed standards defined in the Regional PA and were categorized using the Sequoia standards of:

Intensive – 0-15 meter wide space between transects. Usually used in high to moderate archaeological sensitivity areas such as flats, stream terraces, benches, ridge tops, drainages, and areas of less than 15% slope within 100 meters of perennial water sources.

General – 15-45 meter wide spacing between survey transects. Usually used in moderate to low archaeological sensitivity areas, including slopes of 15% to 30%, areas with 100 to 300 meters of a perennial water source, and areas with a light to moderate understory of brush and other vegetation.

Cursory - spacing between survey transects larger than 45 meters. Usually in areas where the terrain was extremely steep (greater than 30%) or where thick brush covered extensive areas.

Pursuant to the Regional PA because of the presence of steep slopes (greater than 30%), and impenetrable brush within an APE, the Zone Archaeologist determined that non-intensive inventory strategies were appropriate in portions of the project area thus allowing previous non-intensive survey strategies to be used for this analysis.

Survey strategy for the 2012 survey was developed to conform to the Regional PA. Pre-field research identify at risk historic properties that may be affected by low intensity prescribed fire in the undertaking's APE. An intensive inventory was "completed in those portions of the APE where *at risk* historic properties are expected to occur and/or may be affected by the undertaking (e.g., fire, fire control lines)" (Regional PA). Locations identified for intensive survey were determined through pre-field research including GLO patents, logging records, oral interview files, archaeological and historical atlases, and site record files and the Sequoia probability model which predicted archaeological and historical sensitivity within an APE.

The Forest's Geographic Information System (GIS) fire history coverage and fire history database was also consulted but it was determined that because there was a lack of previous wildfires within the APE and previous fire could not be used in the determination of survey areas. The GIS was also used to determine which portions of the APE had slope greater than 30% and could be avoided in order to focus on areas of *at risk* historic properties.

All surveys were adequate for the identifying all historic properties within the APE pursuant to the Regional PA. Detailed information concerning survey methods can be founding Archaeological Reconnaissance Report R2012051351004.

Sites

In total, there are 43 known sites, 20 historic sites, 21 known prehistoric sites, and 2 multicomponent sites within the area of potential effect (APE) for this project. In addition to the standard cultural resource sites there are a number of dendrochronological specimen trees and stumps that been sampled from since 1917 and contain 1,000 to 3,000+ year, seasonal to annual resolution environmental records. These trees and stumps will be protected using the same techniques as cultural resources. Also a few of the caves within the project area contain historic signatures which have not been formally recorded as cultural resources.

All site information and locations are protected under the Freedom of Information Act and is available to appropriate Forest Service personnel and COR via the Zone Archaeologist or Forest Archaeologist to insure all sites are avoided by the proposed project.

Determination as to whether the sites qualify for listing on the National Register of Historic Places (NRHP) has not yet been made. Pursuant to Regional PA and 36 CFR 800.4 (c)(1)), all sites will be treated as eligible for the National Register of Historic Places.

Environmental Consequences

Fire and fuels management in all alternatives focuses on restoring the natural fire cycle, fuels reduction using fire treatments, and returning fire to the ecosystem through prescribed burning and managing wildfire.

Any fire can potentially affect cultural resources. The effects of fire on cultural resources are often divided into and described as direct fire, operational, and post-fire effects. Direct effects are those caused by the fire itself. These are caused by either direct contact with flames or being in close proximity to heat produced by combustion or smoke. Operational effects are the result of management operations like line construction or staging. Post-fire effects are most often those caused by the change in soil stability and vegetation following a fire.

The differences in effects on cultural resources from fire come with the differences in the intensity of a fire, the ability to identify cultural resources and initiate protective measures, the type of management actions taken to control the fire, and the post-fire effects.

The potential effect on cultural resources from direct fire depends on the material components of the cultural resource and the magnitude of the heating and combustion generated by a fire. Specifically, fire and its byproducts can alter such resources through total consumption, melting, breakage, spalling, charring, and discoloration. Different materials are vulnerable based on the peak and duration of the exposure to heat and combustion. For example, a wooden structure may easily ignite and be fully consumed, whereas a bedrock milling feature in the same fuel model is relatively impervious to fire. Further, some raw materials may have multiple importance attribute classes that are affected at different temperatures and/or durations. For example, in the case of obsidian artifacts, hydration rinds can be compromised at relatively low temperatures (<200–300°C), whereas severe morphological damage such as breakage or melting generally does not occur until higher temperatures (>700°C) are reached (Deal 2001).

Perishable artifacts (those that have carbon in their makeup) have virtually no tolerance for fire and would be destroyed by it. Non-perishable artifacts (depending on the artifact type) will tolerate only low- or moderate-intensity fire. Cultural landscapes can tolerate fire intensity that will not cause the introduction of non-compatible elements (such as bulldozed fire lines) or a change in vegetation community (chaparral to grasslands).

The magnitude and duration of the heat pulse depends on fuel loading, fuel moisture content, fuel distribution, rate of combustion, soil moisture content, and other factors. The movement of heat into the cultural material is not only dependent upon the peak

temperature reached, but even more so upon the length of time that the heat source is present and the composition of the cultural resource. Because fuels are not evenly distributed on or around a cultural resource, and due to the variability of material types that make up a cultural resource site, a mosaic of heating and corresponding effects usually occurs. The highest heat pulses are usually associated with areas of greatest fuel consumption and the areas that burn the longest.

Artifacts surrounded or in contact with fuels such as wood and duff are most susceptible to direct contact with flames and heat. These artifacts are affected by convection, radiation, and conduction heat transfer. Artifacts and features above the ground surface (i.e., structures, arboglyphs, rock art, etc.) are susceptible to preheating, convection heat transfer, and smoke impacts. Thus, surface and shallow cultural resources consisting of flammable organic components (i.e., wooden structures, botanical remains) are at greatest risk from direct flame impingement, especially high intensity fire.

High-intensity fire in general has a greater potential to negatively affect cultural resources than low-intensity fire. Fires with cool combustion temperatures, generated by sparse understories and light fuels, have a lower potential to affect diagnostic artifact characteristics. Fires designed for cool combustion temperatures, such as controlled burns, can avoid major impacts on archaeological sites and artifacts. Thus, prescribed burns can be effectively used to control vegetation on archaeological sites without damage to cultural resources (U.S. Army Corps of Engineers 1989).

Operational effects are usually from ground-disturbing activities, but can also be from backfires and burnouts, and the use of fire retardants. They are not limited to wildfires, but can also occur during prescribed burns. These effects are not always in the immediate vicinity of a fire, but can occur miles away as a result of the construction of camps, fire lines, etc. Operational effects can be mitigated, if planned in advance, to avoid and protect cultural resources.

Wildfire ignitions are unplanned and thus limit the ability for prior cultural resources identification and the development and implementation of protective measures for cultural resources. These increase the potential for negative effects on cultural resources. Extreme fire behavior associated with uncontrollable wildfire has a higher potential to affect cultural resources. Suppression actions taken for uncontrolled wildfire typically have limited cultural resource management input and have a greater potential to negatively affect cultural resources than pre-planned projects. Managed wildfires, while often having lower fire intensity than uncontrolled wildfire, usually have limited cultural resource management input and also have more potential to negatively affect cultural resources than prescribed fire.

Activities associated with wildfire suppression that cause ground disturbance (such as fire lines, helicopter bases and heliports, base/spike camps, and drop points) can affect cultural resources. Foam or water applied to hot rock surfaces causes spalling, "potliding," or fracturing that can damage archaeological features. Water and retardant drops can damage or destroy historical structures or hasten their deterioration.

Any type of vegetation removal, from either mechanical treatment or fire, reduces protective vegetative cover and increases the visibility of cultural resources, which can result in unlawful collecting and excavation. The lack of vegetation can also contribute to an increase in erosion that can damage or destroy the site matrix. Fire on any level can result in the loss of ethnographic resources and the disturbance and degradation of traditional plant gathering areas, cultural sites, and sacred or spiritual places.

Control lines and other ground disturbances associated with fire protection often provide access into areas that were previously inaccessible, resulting in an increased potential for site damage and vandalism. Erosion runoff from these sites can affect cultural resource sites located within or adjacent to these features.

Fire effects on rock art (a significant cultural resource) include discoloration, soot smudging, rock face spalling, and heat penetration, which changes the organic binder materials for painted elements (Kelly and McCarthy 2000). This effect can result from direct heat if fuels are in close proximity or by convection when an advancing fire preheats the rock surfaces.

Post-fire effects include increased erosion of soils that can remove or bury archaeological resources, increased tree mortality resulting in impacts from trees falling or uprooting, increased rodent and insect populations that can alter subsurface soil structure, intentional and inadvertent looting, increased microbial activity which can lead to increased feeding on organic matter within archaeological soils, and the addition of "new" carbon, which can be move through the soil column of archaeological sites by a variety of agents. These potential effects can be mitigated during prescribed burns through the use of fire prescriptions that limit the intensity of the fire. Low-intensity fire and planned vegetation reduction has a beneficial effect of protecting cultural resources from catastrophic, high-intensity fire and large-scale post-fire erosion.

In the case of fuels reduction, prescribed fire, the project planning process allows time to identify cultural resources and to develop and implement protective measures. This planning leads to greater protection of cultural resources and longer-term protection of cultural resources because of reduced fuel loads. The potential for operational effects is greatly reduced because control lines and staging can be placed to avoid cultural resources. The potential for direct fire and post-fire effects are also reduced because site-specific projects are planned to avoid extreme fire intensity, which has the greatest potential to negatively affect cultural resources.

Looting (including casual collection) and vandalism is known to occur within the logging remains of the Evans Grove. The lack of cover vegetation will make the cultural resources sites more visible and as a result they are more susceptible to damage from vandalism and looting.

Mitigations

Mitigations Applicable to Alternative 1 (No Action)

Under Alternative 1 all cultural resources in the project area will not be exposed to fuel reduction techniques and without these activities, management measures will not be necessary.

Mitigations to Alternatives B

The following procedures will be followed to mitigate potential effects to Cultural Resources, all mitigation actions are consistent with the Regional PA and specifically Appendix H: Region 5 Hazardous Fuels Protocol for Non-Intensive Inventory Strategies for Hazardous Fuels and Vegetation Reduction Projects.

Under the stipulations of the Regional PA the Zone Archaeologist is to conduct pre-field research to identify at risk historic properties that may be affected by low intensity prescribed fire in the undertaking's APE. At Risk Historic Property is

> defined as a property that the Forest Heritage Program Manager (HRM) identifies as susceptible to being adversely affected by specific undertaking activities. An *at risk* [emphasis added] historic property is identified based on property characteristics (e.g., flammability or fragility) and undertaking parameters (e.g., fuel load or fire temperature, or equipment weight or type). Examples are wooden structures susceptible to fire from prescribed burning or rock alignments that can be crushed by tracked vehicles. (Regional PA: H-3)

At Risk Historic Properties for this project were determined to be sites containing a high potential for wooden features or structures, and rock art sites. Of the 38 sites in the APE, 21 sites were identified as At Risk. See Table 3 below for analysis of At Risk Properties.

Site location information is confidential and protected under FOIA. Information where and how site boundaries are delineated will be communicated to the appropriate personnel prior to work occurring in the vicinity of the sites.

All mitigations are designed to protect all "At Risk Historic Properties". Pursuant to the Regional PA the Zone Archaeologist, in conjunction with the fuels, vegetation management, or fire specialists as necessary, shall develop treatment measures for *at risk* historic properties designed to eliminate or reduce potential adverse effects to the extent practicable by utilizing methods that minimize surface disturbance, and/or by planning project activities in previously disturbed areas or areas lacking cultural features.

Sites that are determined to need protection may receive any of the following appropriate protection measures:

a) Fire crews may monitor sites to provide protection as needed.
b) Fire lines or breaks may be constructed off sites to protect at risk historic properties.
c) Vegetation may be removed and fire lines or breaks may be constructed within sites using hand tools, so long as ground disturbance is minimized, and features are avoided, as specified by the Zone or Forest archaeologist.

d) Fire shelter fabric or other protective materials or equipment (e.g., sprinkler systems) may be utilized to protect at risk historic properties.
e) Fire retardant foam and other wetting agents may be utilized to protect at risk historic properties and in the construction and use of fire lines.
f) Surface fuels (e.g., stumps or partially buried logs) on at risk historic properties may be covered with dirt, fire shelter fabric, foam or other wetting agents, or other protective materials to prevent fire from burning into subsurface components and to reduce the duration of heating underneath or near heavy fuels.
g) Trees which may impact at risk historic properties should they fall on site features and smolder can be directionally felled away from properties prior to ignition, or prevented from burning by wrapping in fire shelter fabric or treating with fire retardant or wetting agents.
h) Vegetation to be burned shall not be piled within the boundaries of historic properties unless the location (e.g., a previously disturbed area) has been specifically approved by the Zone or Forest Archaeologist.

The Zone or Forest Archaeologist shall determine whether prescribed fire treatments within site boundaries shall be monitored, and how such monitoring shall occur.

If the Standard Protection Measures cannot provide appropriate protection, the undertaking shall be subject to the provisions of 36 CFR 800.

Mitigations proposed for each site are summarized below in Table 3.

Historic writings (e.g. signatures) within caves will be protected using the standard design measures identified in the Giant Sequoia National Monument Plan. "Protect cave entrances from all activities, including prescribed fire, mechanical treatments, and recreation. Cave entrances will need to be protected from fire by preventing direct ignition of spherical incendiary devices (SID) in cave entrances. SID should not be dropped within 500' above cave entrances and should not be dropped within 200' below or on either side of cave entrances. Locations of cave entrances will be given to the project implementation team in order to protect the entrances"

In order to effectively protect cultural resources a special authority for administrative use under the Monument Plan and Roadless area may be needed to allow ATV use on portions of the railroad grade that are not designated roads.

Post burn ATV use and casual collection

In order to mitigate the potential looting and vandalism and to protect exposed, sensitive cultural resources, barriers will be placed to block off illegal travel routes, and level 1 roads (13S05C and 13S44), and cameras will be utilized to monitor access points and sites.

Forest Service law enforcement personnel and recreation patrols will be increased. Patrols are expected to be effective by portraying a FS presence in the burned area and reducing the opportunity for potential vandals and looters. Patrols should continue until

public interest decreases, and re-growth has served to obscure previously exposed artifacts and features. Law enforcement officers have authority to take action on artifact collectors, looters, and off road vehicle violators.

Archaeological site stewards certified through the California Archaeological Site Steward Program and part of the Sequoia National Forest Site Steward Program would be assigned to monitor selected sites.

All law enforcement officers, forest service personnel and site stewards assigned to the project will receive annual Archaeological Resource Protection Act (ARPA) and cultural resource protection training conducted by the Zone Archaeologist and a law enforcement officer.

Trails maintenance work

On all historic trails work will be limited to routine trail maintenance limited to brushing and light maintenance of existing tread with hand tools.

When Avoidance Is Not Possible.

If a procedure described above cannot be implemented to protect cultural resources, the Forest Zone or Forest Archaeologist shall immediately consult with State Historic Preservation Office (SHPO). If the SHPO and Forest agree that the activity will not diminish or destroy those qualities that may make the property eligible or potentially eligible (including potential visual impacts if NRHP criteria A or C may be relevant) then the permitted use may continue without further mitigation.

Unanticipated Discoveries

There is always the possibility that surface and sub-surface cultural resources will be located during project operations. Should any additional project cultural resources be located, the find must be protected from operations and reported immediately to the Cultural Resource staff. All operations in the vicinity of the find will be suspended until the sites are visited and appropriate recordation and evaluation is made by the Zone or Forest Archaeologist.

Effect on Cultural Resources

Alternative 1

Alternative 1 would have the highest potential to negatively affect cultural resources because it relies on unplanned natural processes for ecological restoration. The reliance on wildfire would limit the ability for implementation of protective measures for cultural resources. This would increase the potential for negative effects on cultural resources. Extreme fire behavior associated with uncontrollable wildfire has a higher potential for negative effects on cultural resources. Suppression actions taken during uncontrollable wildfire have limited cultural resource management input and have a higher potential to negatively affect cultural resources than preplanned projects. Managed wildfire, while often having lower fire intensity than uncontrolled wildfire, often has limited cultural resource management input and has more potential to negatively affect cultural resources

than prescribed fire. The lack of planned projects would restrict the ability to increase knowledge of the cultural resources.

Alternative 2

Alternative 2 would have the least potential to negatively affect cultural resources because it relies on prescribed fire. The use of prescribed fire allows the greatest ability to implement protective measures for cultural resources. This would greatly increase the protection during project implementation and minimize the potential for uncontrollable wildfire that could potentially negative effect cultural resources. The increased ability to protect cultural resources would allow us to increase our knowledge of the cultural resources.

Direct, indirect, and operational fire impacts from Alternative 2 can be mitigated pursuant to the Regional PA through use of standard protection measures, stated previously in this report.

The reduction of fuels on and surrounding cultural resources within the Boulder Creek Fuels Restoration APE will increase the visibility of artifacts and features. The existing use of ATVs within the APE can be expected to increase following fuels reduction especially on the railroad grades. The increased use and visibility could lead to an increase in looting and vandalism to cultural resource sites. The increase in ATV use on railroad grades and potential looting can be decreased through the use of barrier placement on railroad entry ways post burn and increased patrols.

The mitigations to patrol, and if necessary, cite violators, would reduce potential damages through looting, vandalism or illegal ATV use.

Cumulative Effects for Cultural Resources

Cumulative Effects Common to all Alternatives

Cultural resources in the project area have been potentially subject to impacts from land use such as ATV use, cattle grazing, hiking, hunting, and dispersed camping. None of the proposed actions, including the No Action Alternative, when mitigations are applied will increase or decrease impacts from these common land uses.

Alternative 1

Alternative 1 does not propose any actions and would have no direct effect to Cultural Resources. Lack of fuels management could lead to an indirect adverse effect to at risk cultural resources. The potential indirect effect of looting and casual collection is likely to continue at its present level with a lower potential effect than Alternative 2 due to sites being obscured by vegetation and duff. The cumulative effects from other activities is also slightly decreased from that of Alternative 2 due to the vegetation on sites being a barrier to grazing, hiking, hunting and dispersed camping.

Alternative 2

For the Boulder Burn Fuels Restoration Project all surveys and site protection measures have and will follow survey and site protection standards defined in the Regional PA. By following these standards and increased post burn patrols and monitoring in the Mitigation section of this report, I have determined that Alternative 2 to have a **No Adverse Effect** to historic properties under NHPA through use of management measures. Therefore Alternative 2 would have no indirect, direct effects, or cumulative effects from on-going and reasonably foreseeable actions under NEPA.

Table 3. Sites within APE , Potential Effects and Mitigations

FS SITE NUMBER	TRINOMIAL (CA-FRE-)	AT RISK PROPERTY	COMPONENTS	POTENTIAL EFFECT TO ARCHAEOLOGICAL MATERIALS/FEATURES	UNIT	ACTIVITY	MITIGATIONS
05135100004/22/23/24/166		Yes	Hume-Bennett Railroad, log landings, Wood platform, trestles, wood structures	Loss of wooden features	2/3A	Underburn	Removal of fuels and direct protection of site during burn.
05135100025/258	873	No	BRM, cupules	Spalling	2	Underburn	Monitor for heavy fuels preburn and remove if exist
05135100043	878	No	BRM	Spalling	3A	Underburn	Monitor for heavy fuels preburn and remove if exist
05135100044	0879	Yes	Pictograph BRM	Spalling/sooting of rock art	3A	Underburn	Remove fuels preburn
05135100103		Yes	Wooden cabin	Loss of structure	2	Underburn	Removal of fuels and direct protection of site during burn.
05135100139	1520	Yes	Petroglyphs	Spalling	3B	Underburn	Remove fuels from surrounding boulder
05135100143	1513H	No	Boulder Creek bridge	Loss of Wooden components/ Spalling	4B	Allowed to Creep	Reduce fuels around abutments and direct protection to wooden features
05135100145	1496	Yes	Pictograph	Spalling/sooting of rock art	4A	No Treatment Planned	Remove fuels surrounding shelter
05135100146		No	Burton Pass trail	Loss of blaze trees	3B/4A	Underburn	Monitor for heavy fuels around blazed trees preburn and remove if exist
05135100148	1526	No	BRM, midden, lithic	Spalling, mixing of carbon into midden, loss of obsidian hydration	3C	Underburn	Monitor for heavy fuels preburn and remove if exist
05135100150	1522	No	BRM	Spalling	4A	No Treatment Planned	None
05135100151	1523	No	Cupules	Spalling	4A	No Treatment	None

FS SITE NUMBER	TRINOMIAL (CA-FRE-)	AT RISK PROPERTY	COMPONENTS	POTENTIAL EFFECT TO ARCHAEOLOGICAL MATERIALS/FEATURES	UNIT	ACTIVITY	MITIGATIONS
						Planned	
05135100152	1524	No	Cupules	Spalling	4A	No Treatment Planned	None
05135100157	1521	No	BRM	Spalling	3B	Underburn	Monitor for heavy fuels preburn and remove if exist
05135100158	1525	No	Cupules	Spalling	3C	Underburn	Monitor for heavy fuels preburn and remove if exist
05135100176		Yes	Kennedy Meadow Cabin	Loss of structure	3A	Underburn	Remove fuels and direct protect during fire
05135100252	2885H	Yes	Camp 7	Loss of burnable features and artifacts	3A	Underburn	Reduce fuels on site, direct protect specific features and monitor during burn
05135100253	2886H	Yes	Mine pits	Loss of burnable features and artifacts	3A	Underburn	Remove artifacts before burn and return after burn
05135100254	2887H	Yes	Milled wood	Loss of burnable features and artifacts	2	Underburn	Remove wooden artifacts and return or direct protect during fire
05135100255		Yes	Collapsed mill	Loss of burnable features and artifacts	2	Underburn	Reduce fuels and direct protect during burn
05135100257		Yes	Camp 6	Loss of burnable features and artifacts	2	Underburn	Direct protection of features, fuels reduction, no staging, monitoring during burn
05135100300		No	Lithic and historic	Loss of obsidian hydration	1	Underburn	Monitor for heavy fuels preburn and remove if exist
05135100301		Yes	Deer Meadow trail	Loss of blaze trees	1/4B	Underburn/ Allowed to Creep	Monitor for heavy fuels around blazed trees preburn and remove if exist
05135100313		No	Cupules	Spalling	4A	No Treatment Planned	None
05135100328		Yes	Pictograph, BRM, lithic scatter	Spalling and sooting	4A	No Treatment Planned	Reduce fuels near and on features

FS SITE NUMBER	TRINOMIAL (CA-FRE-)	AT RISK PROPERTY	COMPONENTS	POTENTIAL EFFECT TO ARCHAEOLOGICAL MATERIALS/FEATURES	UNIT	ACTIVITY	MITIGATIONS
05135100329		Yes	Lithic, pottery	Loss of obsidian hydration	4A	No Treatment Planned	None
05135100330		No	Lithic	Loss of obsidian hydration	3B	Underburn	Monitor for heavy fuels preburn and remove if exist
05135100331		No	BRMs	Spalling	3B	Underburn	Monitor for heavy fuels preburn and remove if exist
05135100361		Yes	BRMs	Spalling	3B	Underburn	Remove heavies and monitor postburn
05135100362		Yes	BRMs	Spalling	4A	Allowed to Creep	Remove logs from site
05135100377		No	BRM	Spalling	4B	Allowed to Creep	Monitor for heavy fuels preburn and remove if exist
05135100403		No	Lithic scatter	Loss of obsidian hydration	4B	Allowed to Creep	Monitor for heavy fuels preburn and remove if exist
05135100418		Yes	Blazed trail	Loss of blaze trees	4B	Allowed to Creep	Monitor for heavy fuels around blazed trees preburn and remove if exist
05135100426		Yes	Wood structure, scatter	Loss of wooden structure and artifacts	2	Underburn	Reduce fuels on site, and direct protect features
05135100436		Yes	Blazed trail	Loss of blaze trees	3A	Underburn	Monitor for heavy fuels around blazed trees preburn and remove if exist
05135100448		Yes	Historic scatter	Melting of glass	3A	Underburn	Monitor for heavy fuels preburn and remove if exist
05135100471		No	BRM, midden, lithic	Spalling, mixing of carbon into midden, loss of obsidian hydration	1	Underburn	Monitor for heavy fuels preburn and remove if exist
05135100473		Yes	Kanawyer trail	Loss of blaze trees	1/3A	Underburn	Monitor for heavy fuels around blazed trees preburn and remove if exist

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